IN THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

Claims 1 to 32 (canceled).

Claim 33 (currently amended): A method for non-destructive testing of an element ~~for~~ of a nuclear reactor, comprising:

acquiring a radiographic digital image of at least one area in the element of the nuclear reactor;

creating a reference image through digital processing of the radiographic image obtained; and

comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects.

Claim 34 (previously presented): The method according to claim 33, wherein the element is part of a nuclear fuel assembly.

Claim 35 (previously presented): The method according to claim 34, wherein the element is a nuclear fuel rod extending along a longitudinal axis and comprising a sheath sealed by top and bottom plugs and containing a nuclear fuel.

Claim 36 (previously presented): the method according to claim 35, wherein the area comprises a weld bead between one of the plugs and the sheath.

Claim 37 (previously presented): The method according to claim 35, wherein the area

comprises a spot weld sealing off a channel passing through the plug.

Claim 38 (currently amended): A method for non-destructive testing of an element ~~for~~ of a nuclear reactor, comprising:

acquiring a radiographic digital image of at least one area in the element of the nuclear reactor;

creating a reference image through digital processing of the radiographic image obtained; and

comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects~~The method according to claim 33~~, wherein the step of creating a reference image through digital processing of the radiographic image obtained comprises a substep of one of opening and closing the image by adding a structuring element.

Claim 39 (currently amended): The method according to claim 38, wherein the element is a nuclear fuel rod extending along a longitudinal axis and the structuring element has a shape that is elongated along the longitudinal axis of the rod.

Claim 40 (previously presented): The method according to claim 39, wherein the structuring element is a segment of p pixels, wherein p is a whole number that is not zero.

Claim 41 (currently amended): The method according to claim 39, wherein the nuclear fuel rod comprises a sheath sealed by top and bottom plugs and containing a nuclear fuel, a weld bead being between one of the plugs and the sheath and wherein a defect that has to be detected is one of porosity and lack of penetration of the weld bead and ~~in that~~ the substep is opening the image by adding the structuring element.

Claim 42 (currently amended): The method according to claim 39, wherein a defect that has to be detected is a tungsten inclusion and ~~that~~ the ~~subset~~ substep is closing the image by

~~addition of~~ adding the structuring element.

Claim 43 (currently amended): The method according to claim 38, wherein the step of creating a reference image through digital processing of the radiographic image obtained has a substep of smoothing the image through a convolver prior to the substep of one of opening and closing the image by adding a structuring element.

Claim 44 (previously presented): The method according to claim 43, wherein the convolver is a square of n adjacent pixels, wherein n is a whole number that is not zero.

Claim 45 (currently amended): A method for non-destructive testing of an element of a nuclear reactor, comprising:

acquiring a radiographic digital image of at least one area in the element of the nuclear reactor;

creating a reference image through digital processing of the radiographic image obtained; and

comparing the radiographic digital image obtained, one if processed and unprocessed, with the reference image to detect a presence of defects~~The method according to claim 33,~~ wherein the step of comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects comprises a substep of calculating a difference between the acquired image that is one of processed and unprocessed, and the reference image and of dividing the difference by one of the radiographic image obtained, that is one of processed and unprocessed, and the reference image.

Claim 46 (previously presented): The method according to claim 45, wherein after the substep, the image is multiplied by a coefficient substantially corresponding to a maximum light intensity of a viewing device used to obtain the radiographic image.

Claim 47 (previously presented): The method according to claim 45, wherein after the

substep, the image is smoothed using a convolver.

Claim 48 (previously presented): The method according to claim 47, wherein the convolver is a square of q adjacent pixels, wherein q is a whole number.

Claim 49 (previously presented): The method according to claim 47, wherein the convolver lies transversely with respect to a longitudinal axis extending along the element.

Claim 50 (previously presented): The method according to claim 45, further comprising:

binarization of the image after the substep of calculating a difference between the acquired image that is one of processed and unprocessed, and the reference image and of dividing the difference by one of the radiographic image obtained, that is one of processed and unprocessed, and the reference image.

Claim 51 (previously presented): The method according to claim 37, wherein the step of creating a reference image through digital processing of the radiographic image obtained comprises a substep of projecting the image along the longitudinal axis and reconstructing the image from projection along the axis.

Claim 52 (currently amended): The method according to claim 51, further comprising:

smoothing the image acquired by ~~the~~ a convolver prior to the substep of projecting the image along the longitudinal axis and reconstructing the image from projection along the axis.

Claim 53 (previously presented): The method according to claim 52, wherein the convolver is a square of t adjacent pixels, wherein t is a whole number.

Claim 54 (previously presented): The method according to claim 51, wherein comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference

image to detect a presence of defects comprises a substep of subtracting the reference image from the image obtained.

Claim 55 (previously presented): The method according to claim 54, further comprising:

binarization of the image after the substep of subtracting the reference image from the image obtained.

Claim 56 (previously presented): The method according to claim 33, further comprising:

automatically detecting and determining characteristics of a region of the image produced in comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects corresponding to a defect.

Claim 57 (previously presented): The method according to claim 56, wherein one of the characteristics is a position of the defect detected in the image.

Claim 58 (currently amended): The method according to claim 56, wherein one of the characteristics is representative of a dimension of the defect.

Claim 59 (previously presented): The method according to claim 51 further comprising:

determining a minimal axial thickness of the spot weld.

Claim 60 (previously presented): The method according to claim 56, wherein the method is performed for more than one viewing angles.

Claim 61 (currently amended): The method according to claim 60, wherein one of the characteristics is a position of the defect detected in the image and one of the characteristics is representative of a dimension of the defect, the method further comprising:

reconstructing defects detected in the images corresponding to the more than one

viewing angles.

Claim 62 (previously presented): The method according to claim 61, wherein the step of reconstructing defects detected in the images corresponding to the more than one viewing angles comprises a first substep of determining positions which a defect detected in a first image corresponding to a first viewing angle occupies in a second image corresponding to a second viewing angle, a second substep of comparing positions so determined with the positions of the defect actually detected in the second image to determine whether the defect has been detected in the second image, and upon detection of the defect in the second image, performing a third substep of calculating a dimension of the defect from representative characteristics of the dimensions of the defect determined in the first and second image.

Claim 63 (currently amended): The method according to claim 58, wherein the method is performed for more than one viewing angles, the method further comprising:

summing representative characteristics of the dimension determined for more than one viewing angles and comparing the sum with a threshold value in order to obtain a decision on whether the element conforms with predetermined manufacturing criteria.

Claim 64 (currently amended): The method according to claim 59, wherein the method is performed for more than one viewing angles, the method further comprising:

calculating a mean of ~~a~~ minimum thicknesses determined for ~~from~~ several viewing angles and comparing ~~this~~ the mean of minimum thicknesses with a threshold value to make a decision on whether the element conforms with predetermined manufacturing criteria.